Weibull Olasılık Yoğunluk fonksiyonu

3 parametreli

$$p(x) = \frac{b}{a}\left(\frac{x-c}{a}\right)^{b-1} exp\left[-\left(\frac{x-c}{a}\right)^{b}\right]$$

Burada,

$$p(x) \geq 0, x \geq 0 \;\; veya \;\; c, b > 0, a > 0, -\infty < c < \infty$$

ve,

- a = ölçek parametresi (scale parameter),
- b = şekil parametresi (shape parameter (or slope)),
- c = location parameter.

2 parametreli Wiebull Dağılımı : c=0 için;

$$p(x) = \frac{b}{a}\left(\frac{x}{a}\right)^{b-1} exp\left[-\left(\frac{x}{a}\right)^{b}\right]$$

Eklenik Dağılım Fonksiyonu

$$P(x) = 1 - exp\left[-\left(\frac{x}{a}\right)^{b}\right]$$

$$x(P) = a.[-Ln(1-P)]^{1/b}$$

Momentler Yöntemiyle Parametrelerin tahmini

Monahan, A.H. (2006);

$$a = \frac{mean(x)}{\Gamma\left[1+\frac{1}{b}\right]} \quad \text{ve} \quad b = \left[\frac{mean(x)}{\text{std(x)}}\right]^{1.086}$$

Fawzan, M.A (2000);

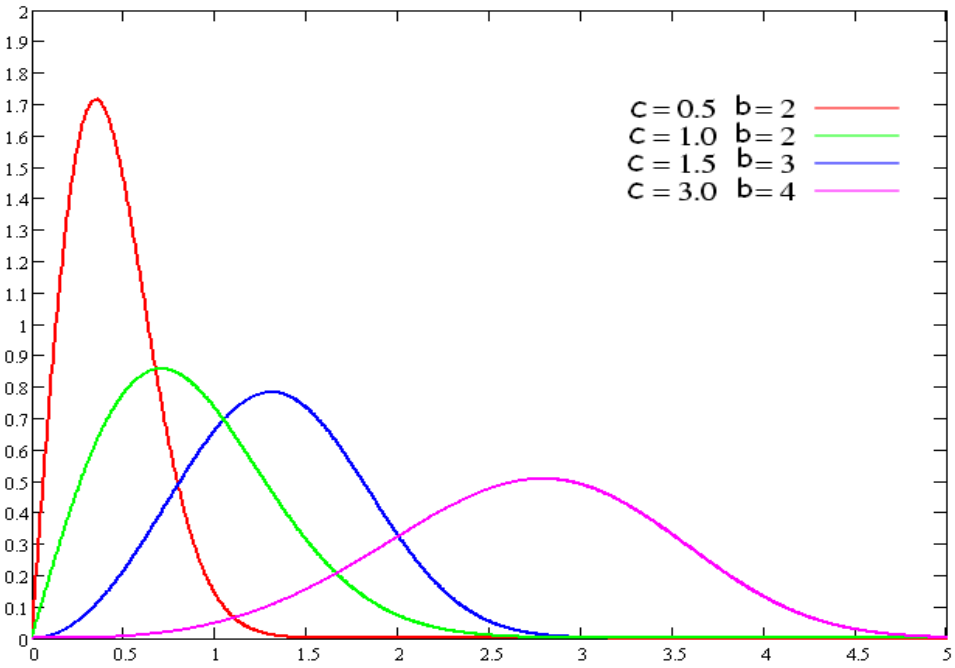
$$CV = Değişim\ Katsayısı = \frac{\sqrt{\Gamma\left(1+\frac{2}{b}\right) - \Gamma^2\left(1+\frac{1}{b}\right)}}{\Gamma\left(1+\frac{1}{b}\right)}$$

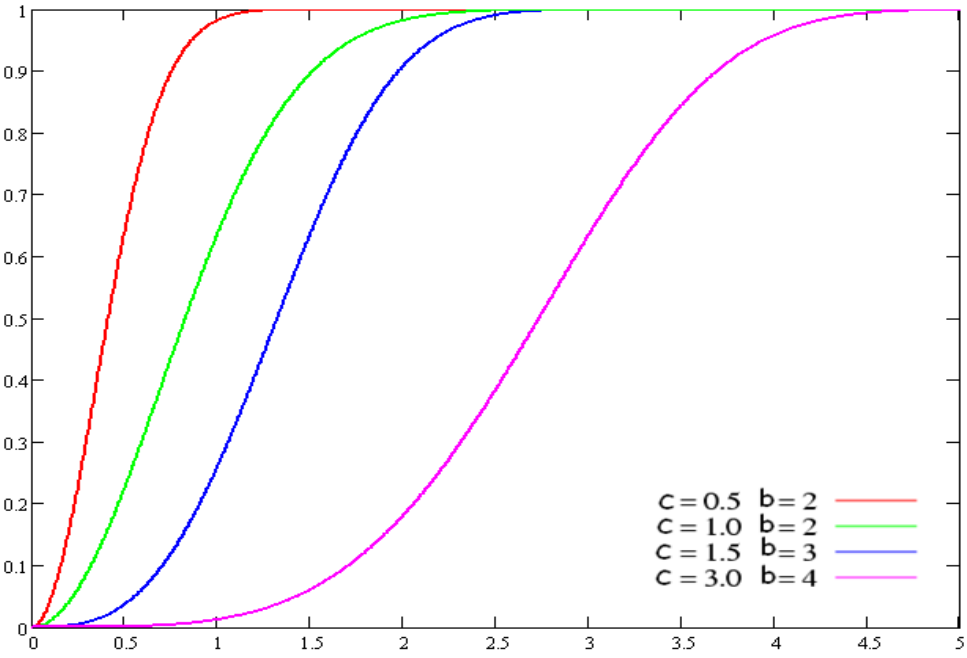
$$\hat{a} = \left[\frac{\bar{x}}{\Gamma\left[1+\frac{1}{\hat{b}}\right]}\right]^{\hat{b}}$$

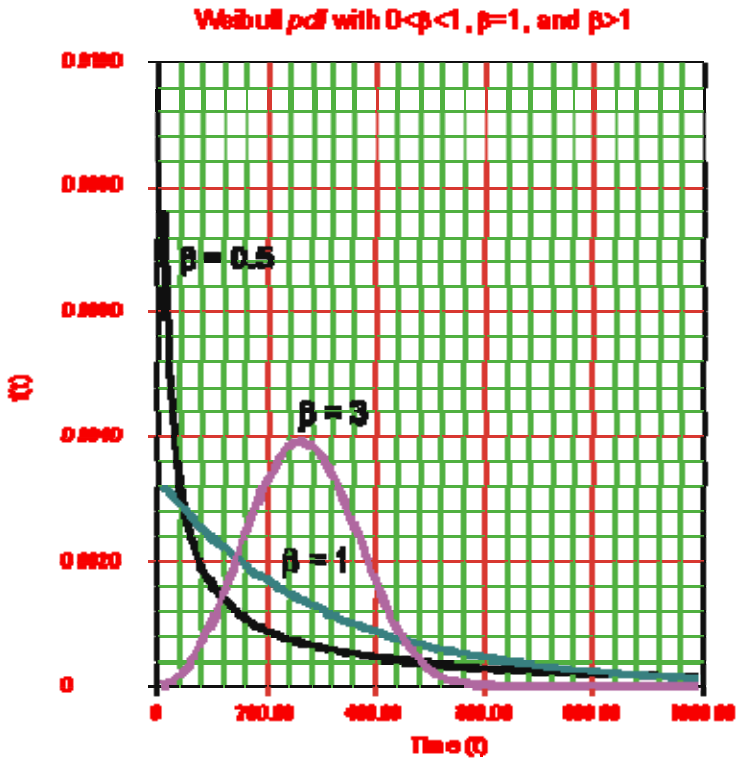
Hosking, J.R.M.,

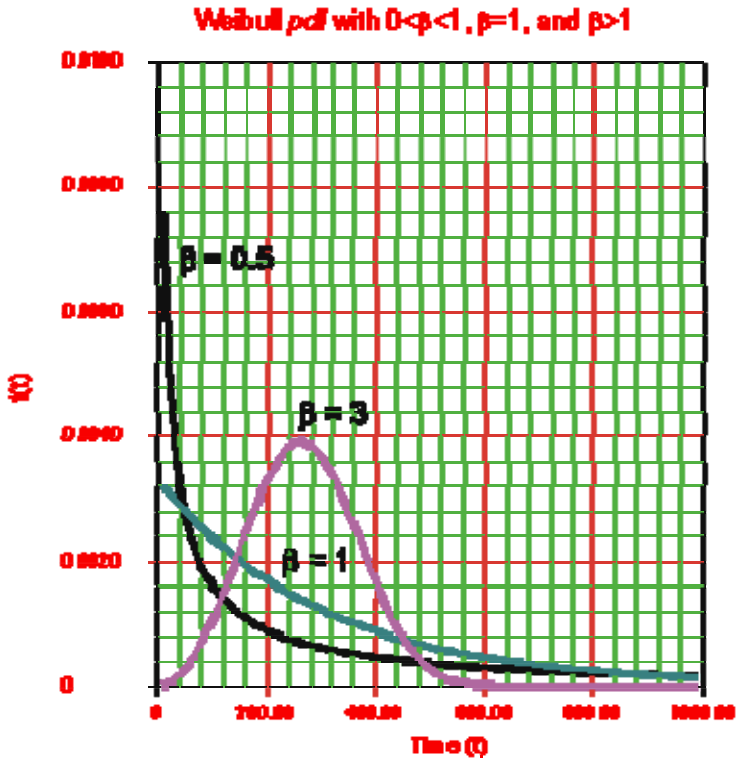
$$a = \frac{\mu}{\Gamma\left(1+\frac{1}{b}\right)}$$

$$a = \frac{\sigma}{\sqrt{\Gamma\left(1+\frac{2}{b}\right) - \Gamma^2\left(1+\frac{1}{b}\right)}}$$




c = 0.5 b = 2
c = 1.0 b = 2
c = 1.5 b = 3
c = 3.0 b = 4


Weibull pdf with 0<β<1 , β=1, and β>1
β = 0.5
β = 3
β = 1
Time (t)



The effect of the Weibull shape parameter on the *pdf*.